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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,071	02/17/2004	David C. Lizon	ADEP.01USU1	9469
27479	7590	06/03/2005	EXAMINER	
COCHRAN FREUND & YOUNG LLC			FRANK, RODNEY T	
2026 CARIBOU DR			ART UNIT	
SUITE 200			PAPER NUMBER	
FORT COLLINS, CO 80525			2856	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/780,071

Applicant(s)

LIZON ET AL.

Examiner

Rodney T. Frank

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/1; 5/16/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (U.S. Patent Number 5,996,406). Ward discloses an advanced signal processing technique accurately discriminates and estimates a small sinusoidal signal in close proximity from one or more large sinusoidal signals. The technique involves using digital processing techniques to accurately estimate the frequency (96), amplitude (94) and phase (98) of the one or more large sinusoids and then using this estimate to obtain an accurate estimate of the small sinusoidal signal by subtracting the large sinusoid from the data to obtain a residual and reprocessing the residual (Please see the abstract).

In regard to claim 1, Ward discloses and shows in figures 1 and 2 an apparatus for measuring liquid level in a container which comprises in combination:

(a) a device (10) in physical-contact with the outside of a wall of the container (12) for generating at least two acoustic resonance responses in the liquid substantially perpendicular to the surface;

The examiner would like to note that though the device is not explicitly disclosed to be a transducer, the device is disclosed to emit RF signals and perform a level measurement based upon transmitted and reflected signals (see column 2 lines 32 through 48), which would make this an ultrasonic type device. It is well known in the liquid measurement art that transducers, piezoelectric crystals, ultrasonic transmitters, and radar type level measurement devices are established equivalents for performing the same function of emitting a signal and receiving the reflected signal to determine liquid level. Therefore, the use of a transducer as the transmission element for Ward would be considered obvious to one of ordinary skill in the art at the time of the invention.

The examiner also notes that the Ward device has the signal generation means located at the top of the tank and not at the bottom as claimed. The examiner would note that the position of the transmitter is more of a factor of convenience than performance as the position of the transmitter/receiver does not change the performance of the device, and therefore, though not in the exact orientation as claimed, the Ward reference is still deemed as prior art since the device performs in the same fashion and there is no disclosure shown any advantage resulting from changing the position, nor any unexpected result stemming from positioning the transducer element at the bottom of the tank.

(b) a sweep generator (40 in figure 2) for electrically exciting said device over a chosen range of acoustical frequencies and having a chosen waveform, and

(c) a receiver for measuring the acoustic frequencies for at least two resonant responses.

In regard to claims 2 and 9, the sweep generator is disclosed to generate a sinusoidal signal, thus a sine wave is disclosed.

In regard to claim 3-5 and 10-12, though these exact parameters of the calculation are not specifically disclosed, the examiner takes the position that the use of, for example, a Fast Fourier Transform, which is a time domain measurement, a specific resonance, or the sine function given, is just one of many time domain techniques that may be used by one of ordinary skill in the art to determine a travel time and/or interpret data from a level system, and would therefore be an obvious design choice for the circuitry for the device to operate depending on the specific desire of the user. For example, column 4 line 30 through column 5 line 14 describe various methods that may be used to interpret data obtained by the Ward system, of which one is the discrete Fourier transform (DFT), and even the disadvantages of using the DFT method. Therefore, the use of various formulas and algorithms to determine the liquid level would be obvious to one of ordinary skill in the art.

In regard to claim 6, Ward discloses and shows in figures 1 and 5 an apparatus for measuring Liquid level in a container which comprises in combination:

(a) means (10) in physical contact with the outside of a wall of the container (12) located below the surface of the liquid for generating at least two acoustic resonance responses in the liquid substantially perpendicular to the surface, and for determining the acoustic frequencies of at least two resonant responses; and

(b) means for electrically exciting said means for generating at least two acoustic resonance responses over a chosen range of acoustical frequencies and having a chosen waveform (40).

In regard to claim 7, the means for generating the two at least acoustic responses and for determining said acoustic frequencies of said responses comprises an acoustic transducer and acoustic receiver.

In regard to claim 8, a sweep generator is disclosed (40).

In reference to method claims 13-16, though the method is not explicitly spelled out, since the apparatus parameters appear to be disclosed, then the method to operate such a device would also be obvious to one of ordinary skill in the art in view of the prior art.

In regard to claims 17, 18, and 19, these claims are more broad recitations of the apparatus claims above, and the examiner feels that since the specific, more narrow claims are disclosed, and then the broad, general apparatus is disclosed as well.

In reference to claim 20, Ward discloses a method for measuring liquid level in a container, which comprises the steps of:

(a) generating at least two acoustic resonances in the liquid substantially parallel to the surface of the liquid, and

(b) detecting the presence of acoustic resonances from the liquid.

This is generally disclosed in column 2 line 32 through column 3 line 65.

***Response to Arguments***

Art Unit: 2856

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

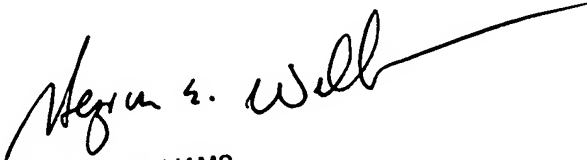
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney T. Frank whose telephone number is (571) 272-2193. The examiner can normally be reached on M-F 9-5:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RTF  
May 25, 2005

  
HEZRON WILLIAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800